CLAIMS

1. A gripping device (1) for a manipulation system (5), particularly for a robot, for receiving parts and feeding a manufacturing plant, e.g. a metal sheet folding machine, punching press, welding plant etc., with a workpiece (2) lifted from a readied stack (3) of workpieces by a gripper head (6) fitted with gripping means (7), e.g. suction cups (9), magnets, tongs etc., and with a detection system (12) for the workpiece (2) received by the gripping means, wherein at least one pulse emitter (13) acting upon the workpiece as a vibration exciter, and at least one vibration sensor (15) are arranged on the gripper head (6), forming the detection system (12).

2. The gripping device according to claim 1, wherein the pulse emitter (13) is provided with a sensor element (33), particularly a piezo sensor (34).

3. The gripping device according to claim 1 or 2, wherein a memory and/or analytical module (20) connected with the vibration sensor via a cable line is arranged on the gripper head (6).

4. The gripping device according to claim 2, wherein the memory and/or analytical module (20) and the pulse emitter are connected with a controller (10) of the manufacturing system via a cable line.

5. The gripping device according to one or more of the preceding claims, wherein data are transmitted wireless between the vibration sensor (15) and the memory and/or analytical module (20) and/or the controller (10).

6. The gripping device according to one or more of the preceding claims, wherein the pulse emitter (13) is formed by a striking tappet (17) acted upon by kinetic energy.

7. The gripping device according to one or more of the preceding claims, wherein the vibration sensor (15) is formed by an acceleration sensor (18) placeable onto a surface (11) of the workpiece (2).

8. The gripping device according to one or more of the preceding claims, wherein the

pulse emitter (13) is provided with the vibration sensor (15).

9. The gripping device according to one or more of the preceding claims, wherein the acceleration sensor (18) is supported on the gripper head (6) via a contact-pressure exerting device (19).

10. The gripping device according to one or more of the preceding claims, wherein the detection system (12) is preferably supplied with energy by means of an ASi bus.

11. The gripping device according to one or more of the preceding claims, wherein data are preferably transferred between the detection system (12) and the controller (10) by means of an ASi bus.

12. The gripping device according to one or more of the preceding claims, wherein the pulse emitter (13) and the vibration sensor (15) are arranged on the gripper head (6) with a spacing from each other.

13. The gripping device according to one or more of the preceding claims, wherein contact points of the pulse emitter (13) and the vibration sensor (15) are provided on a surface (11) of the workpiece (2) outside of the surface area (23) of the surface (11) of the workpiece (2) defined by the gripping means (7).

14. The gripping device according to one or more of the preceding claims, wherein the detection system (12) with the memory and/or analytical module (20) is detachably connected with the gripper head (6) via coupling means.

15. A gripping device (1) for a manipulation system (5), particularly for a robot, for receiving parts and feeding a manufacturing plant, e.g. a metal sheet folding machine, punching press, welding plant etc., with a workpiece (2) from a stack (3) of readied workpieces (2) with a gripper head (6) fitted with gripping means (7), e.g. suction cups (9), magnets, tongs etc., and with a detection system (12) for the workpiece (2) received by the gripping means, wherein a pressure sensor (38) associated with at least one gripping means (7) is arranged on the gripping head (6), said pressure sensor forming the detection device (12) and being line-connected to a memory and/or analytical module (20).

16. The gripping device according to claim 15, wherein a pressure sensor (38) is associated with each of several gripping means (7) arranged on the gripper head (6).

17. The gripping means according to claim 15 or 16, wherein at least one gripping means (7) is arranged on the gripper head (6) and adjustable in a direction extending about perpendicularly to a surface (11) of the workpiece (2).

18. The gripping device according to any one of claims 15 to 17, wherein the memory and/or analytical module (20) is line-connected with a controller (10).

19. The gripping device according to any one of claims 15 to 18, wherein the memory and/or analytical module (20) is arranged on the gripper head (6).

20. A method for operating a gripping device (1) according to one or more of claims 1 to 14, wherein for feeding a manufacturing plant, particularly a metal sheet folding machine for shaping workpieces (2) by folding with a manipulation system, the workpieces (2) are received from a stack (3) with a gripping device (1) of the manipulation system (5) provided with gripping means (7), whereupon the workpiece (2) is put into vibration by means of a pulse emitter arranged on the gripping device (1) and acted upon by a controller (10), and the vibration spectrum is recorded in the form of pulse signals by a vibration sensor (15) arranged on the gripping device (1), and transmitted to a memory and/or analytical module (20), and compared in the latter with reference data of the vibration spectrum of the workpiece (2) stored in said module (20).

21. The method for operating a gripping device (1) according to one or more of claims 15 to 19, wherein for feeding a manufacturing plant, particularly a metal sheet folding machine for shaping workpieces (2) by folding with a manipulation system (5), the workpieces (2) are received from a stack (3) of workpieces (2) by a gripping device (1) of the manufacturing system (5) provided with gripping means (7), whereupon a pressure force applied to the workpiece (2) is determined via a pressure sensor (38) arranged on the gripping device (1) and/or upstream of at least one gripping means (7), and compared with reference data for pressure forces of a workpiece (2) stored in the memory and/or analytical module (20).